

CLAIMS

1. A process for producing a mesophase pitch based active carbon fiber, comprising the steps of:

(I) carbonizing a mesophase pitch based infusibilized
5 fiber at 600 to 900°C,

(II) activating the thus obtained carbon fiber in the presence of alkali, and

(III) immersing the thus obtained mesophase pitch based active carbon fiber in an electrolyte and subjecting
10 the immersed mesophase pitch based active carbon fiber to such a charge and discharge treatment that a voltage gradually increased until exceeding 2.5 V is applied at a constant current density to the mesophase pitch based active carbon fiber so that an electric double layer is
15 formed at an interface of the mesophase pitch based active carbon fiber and the electrolyte to thereby effect a charging and thereafter a discharging is effected at a constant current density.

20 2. The process as claimed in claim 1, wherein the mesophase pitch based active carbon fiber obtained in the step (II) has a BET specific surface area of 30 to 1200 m²/g.

3. The process as claimed in claim 2, wherein the
25 mesophase pitch based active carbon fiber obtained in the

step (II) has an average pore radius, calculated from t-plot of a nitrogen adsorption isotherm, of 0.2 to 1 nm.

4. The process as claimed in any of claims 1 to 3, wherein,
5 in the step (III), the charging is performed by applying a voltage gradually increased to 3.5 V in the electrolyte.

5. A mesophase pitch based active carbon fiber for use in an electrode material of an electric double layer
10 capacitor, produced by the process as claimed in any of claims 1 to 4.

6. The mesophase pitch based active carbon fiber as claimed in claim 5, which has a BET specific surface area
15 of 30 to 1200 m²/g.

7. The mesophase pitch based active carbon fiber as claimed in claim 5 or 6, which has an average pore radius, calculated from t-plot of a nitrogen adsorption isotherm,
20 of 0.2 to 1 nm.

8. The mesophase pitch based active carbon fiber as claimed in any of claims 5 to 7, which has after the step (III) an average pore radius not being significantly
25 different from that before the step (III).

9. An electric double layer capacitor including an electrode comprising the mesophase pitch based active carbon fiber as claimed in any of claims 5 to 8.